REMARKS

The Office Action dated December 23, 2003, has been carefully considered. Claims 1-9, 12, 28-30, 36-44, 47, 63-65, 74, 79, 83, 98 and 99 have been amended. Claims 84-97, 100 and 101 directed to an unelected invention have been cancelled. Applicants reserve the right to file a divisional application directed to the nonelected claims. Claims 1-83, 98 and 99 are in this application.

Claim 1 has been amended to include the limitation of surface pathways. Support for this amendment is found throughout the specification and in particular, on page 5, lines 29-30 of the application. Claim 1 has also been amended to define that the heating elements selectively heat the patterned surface for preventing or promoting migration of the liquid. Support for this amendment is found throughout the specification and in particular, on page 11, lines 19-21. No new matter has been entered.

The previously presented claims were rejected under 35 U.S.C. § 103 as obvious in view of U.S. Patent No. 6,068,751 to Neukermans. Applicants submit that the teachings of this reference do not teach or suggest the invention defined by the present claims.

Neukermans discloses a microfluidic delivery system including a microfluidic valve for controlling a flow of fluid through an elongated capillary. The capillary is enclosed by a layer of malleable material. A blade is activated toward the malleable material to occlude the capillary and barring fluid from flowing in the capillary. The blade is retracted away from the malleable material to allow fluid to flow through the capillary. Pressure applied to a fluid reservoir urges liquid in the reservoir to flow along the capillary when the blade is in the retracted position. A reaction chamber coupled to the capillaries can be heated as required for a chemical process.

In contrast to the invention defined by the present claims, Neukermans does not teach or suggest a receiving liquid on a patterned surface comprising one or more surface pathways. To the contrary, Neukermans teaches interior flow of liquid within closed capillaries. Moreover, Neukermans teaches away from surface pathways by teaching the presence of a malleable material to enclose a surface of the capillaries to. Accordingly, there is no teaching or suggestion in Neukermans of migration of fluid along surface pathways.

Furthermore, Neukermans do not teach or suggest individually activating one or more heating elements for preventing or promoting migration of the fluid along surface pathways. Instead, Neukermans teaches mechanical values including an electrically-powered actuator for extending toward or retracting from the malleable material and use of pressure to provide flow of the liquid. However, there is no teaching or suggestion in Neukermans that heating elements can be used to generate flow. As described on page 3, lines 4-7 of the present application, the individually activated heating elements are used to generate flow via thermocapillary effects. In contrast, the flow in Neukermans is generated by mechanical means and the heating elements are only used to provide suitable reaction conditions, such as for PCR. Accordingly, the invention defined by the present claims is not obvious in view of Neukermans.

Claims 98 and 99 were rejected as obvious in view of pages 353-355 of "Thermocapillary Pumping of Discrete Drop in Microfabricated Analysis Devices" by Sammarco et al.

Sammarco et al. disclose thermocapillary pumping of discrete liquid drops within microfabricated channels. The receding interface or the advancing interface of a hydrophobic drop is heated to manipulate surface tension on one side of the drop to create capillary pressure imbalance for drop motion.

In contrast to the invention defined by the present claims, Sammarco et al. do not teach or suggest receiving liquid on a patterned surface comprising one or more surface pathways. Rather, Sammarco et al., similar to Neukermans, teach internal flow of droplets within a microcapillary. As described on page 3, lines 7-10, the present invention provides an open architecture which allows the liquid to remain in constant contact with ambient atmosphere and thermocapillary actuation is provided based on surface stress created by variations in surface tension at a gas-liquid or liquid-liquid interface. In addition, Sammarco et al. do not teach or suggest storing the device in glycerol as defined by present claims 98 and 99. Accordingly, the invention defined by claims 98 and 99 is not obvious in view of Sammarco et al.

In view of the foregoing, Applicants submit that all pending claims are in condition for allowance and request that all claims be allowed. The Examiner is invited to contact the undersigned should he believe that this would expedite prosecution of this application. It is believed that no fee is required. The Commissioner is authorized to charge any deficiency or

credit any overpayment to Deposit Account No. 13-2165.

Respectfully submitted,

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